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Forest Service

1984 United States Department of Agriculture

FS-243

Western Larch

An American Wood

The spectacular western larch, which is the largest of the American larches, occurs throughout the forests of western Montana, northern Idaho, and eastern Washington and Oregon. Western larch wood ranks among the strongest of the softwoods. It is especially suited for construction purposes and is extensively used in the manufacture of lumber and plywood. The species has also been used for poles. Water-soluble gums, readily extracted from the wood chips, are used in the printing and pharmaceutical industries.

F-522053

Western Larch
(*Larix occidentalis* Nutt.)

David P. Lowery[1]

Distribution

Western larch grows in the upper Columbia River Basin of southeastern British Columbia, northeastern Washington, northwest Montana, and northern and west-central Idaho. It also grows on the east slopes of the Cascade Mountains in Washington and north-central Oregon and in the Blue and Wallowa Mountains of southeast Washington and northeast Oregon (fig. 1).

Western larch grows best in the cool climates of mountain slopes and valleys on deep porous soils that may be gravelly, sandy, or loamy in texture. The largest trees grow in western Montana and northern Idaho.

Western larch characteristically occupies northerly exposures, valley bottoms, benches, and rolling topography. It occurs at elevations of from 2,000 to 5,500 feet in the northern part of its range and up to 7,000 feet in the southern part of its range. The species sometimes grows in nearly pure stands, but is most often found in association with other northern Rocky Mountain conifers. Associated species include: ponderosa pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), western white pine (*Pinus monticola*), western redcedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), Engelmann spruce (*Picea engelmannii*), subalpine fir (*Abies lasiocarpa*), and mountain hemlock (*Tsuga mertensiana*).

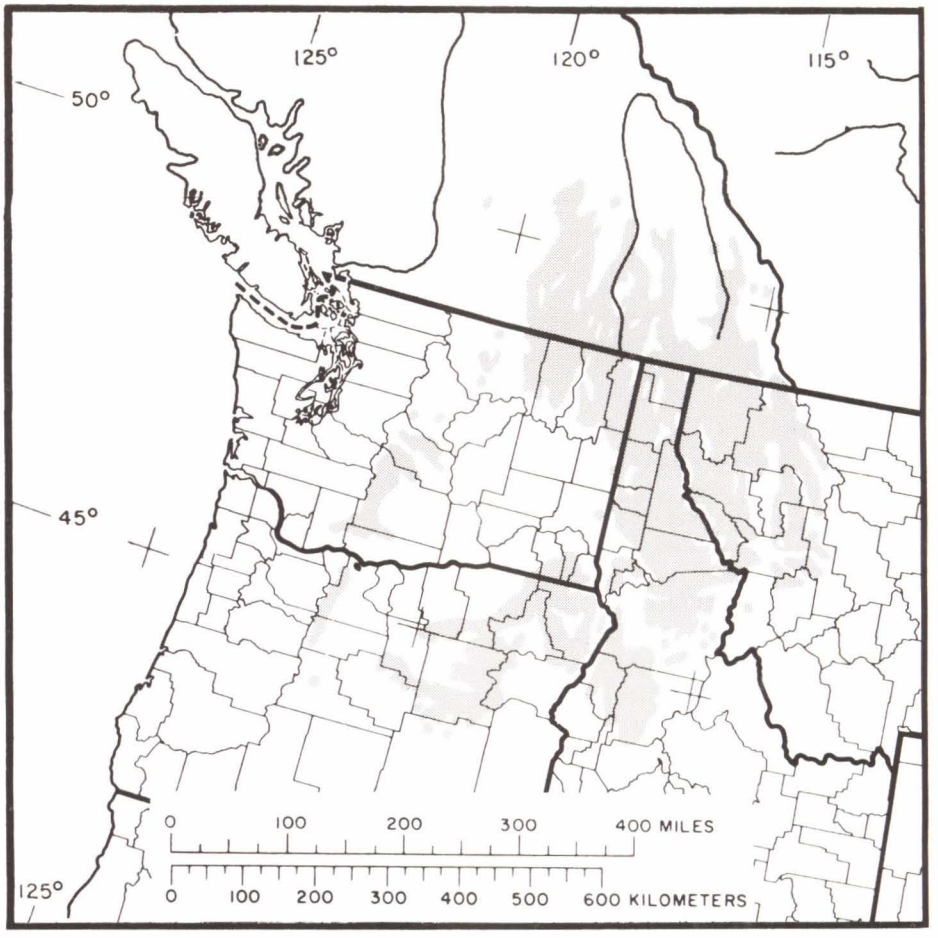

Figure 1—Natural range of western larch. F-532734.

Description and Growth

Western larch is one of the few deciduous conifers in North America. Its needles are shed each winter and are replaced by new ones in the spring. The boles of mature trees are frequently free of branches to considerable height and usually have little taper. The crowns are usually short, open, and essentially pyramidal. The light-green foliage of the spring usually becomes a pale or bright green before turning yellow and dropping in the fall (fig. 2).

Figure 2—Needles and cones of western larch. F-308977

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The needles are 1 to 1-3/4 inches long and are borne singly on elongate twigs or are densely clustered on short spur shoots. New needles generally appear in May or June along with new shoot growth. Needles, like hardwood leaves, drop in October or November after the fall frosts.

Cones are from 1 to 1-1/2 inches long, oblong or rounded, and dark or grayish brown. The trunks of mature and overmature trees have reddish-brown bark, which is 3 to 6 inches thick and composed of rounded plates with deep irregular fissures (fig. 3). The thick bark protects the older trees from fire.

Western larch is long lived; some trees live to be more than 700 years old. At this age, trees may have heights of over 200 feet and diameters of 5 to 8 feet. Trees 250 to 400 years old may be 100 to 180 feet tall and 3 to 4 feet in diameter. Average height at 120 years is about 90 feet.

Larch is moderately to highly resistant to windthrow because its deep, widespreading root system provides excellent anchorage. Although some seeds are produced in all areas every year, good seed crops occur only at about 5-year intervals in most locations.

Common Names

Western larch is frequently called tamarack or western tamarack. It is also known as hackamatack larch, Montana larch, mountain larch, and larch. Products manufactured from this species are almost always referred to as "made of larch."

Related Commercial Species

In the construction-lumber industry, western larch and Douglas-fir are generally sold together under the name Doug fir-larch. However, plywood, poles, and interior paneling are sold, almost without exception, as larch. For these uses, it is rarely mixed with other species.

Supply

In 1977, western larch occupied an estimated 2.5 million acres in Montana,

Figure 3—Bark of western larch. F-500683

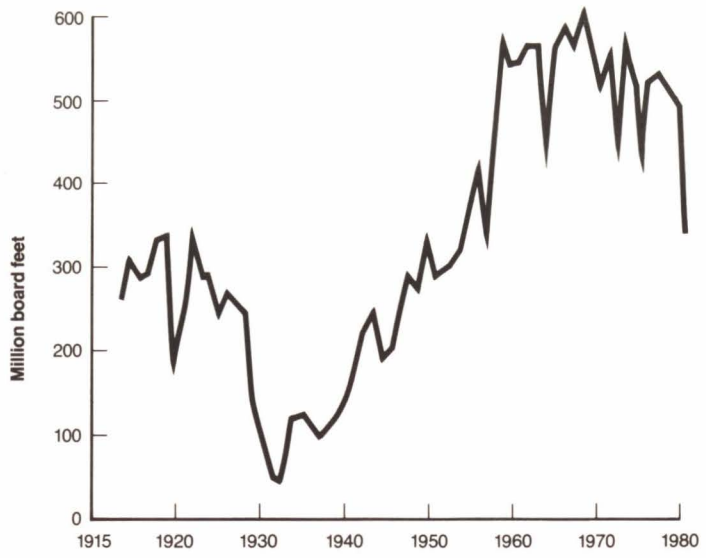

Figure 4—Western larch lumber production, 1915–80.

Idaho, Washington, and Oregon. More than half of this acreage is in western Montana. Idaho has the second largest area of this species.

The total estimated net volume of commercial sawtimber was 30.3 billion board feet with Montana, again, containing about half. The net volume of growing stock, which includes smaller trees, was estimated to be about 6.5 billion cubic feet, with Montana having the major portion.

Production

Western larch lumber production is not recorded separately, but is combined with Douglas-fir throughout the species' range. Therefore, the annual amount of larch lumber produced has been estimated by using the total of larch–Douglas-fir production and the percentage of larch included in National Forest larch–Douglas-fir timber sales. Since larch has other uses besides lumber, the estimates may be somewhat high.

Before 1940, larch was considered a weed species, and the annual lumber production fluctuated around 200 million board feet. However, after 1945, the true value of the species was recognized and lumber production increased steadily. During the past 20 years, it has averaged more than 500 million board feet per year. The greatest single year so far was 1968, when an estimated 592 million board feet of lumber was produced (fig. 4).

Western larch has been used for telephone and transmission poles, piling, and other related roundwood products. In Montana, Idaho, and northeastern Washington, an estimated 1.4 million poles were produced between 1947 and 1962.

Western larch has been a preferred plywood species in Montana and Idaho for many years. Most of the rotary-cut veneer is used to produce construction- or sheathing-grade plywood.

Western larch is susceptible to attack by various destructive insects and diseases, thus decreasing production. Dwarf mistletoe (*Arceuthobium laricis*) is the most serious disease-causing parasite of larch. It can infest seedlings as young as 3 to 7 years old and continue throughout the life of the tree. In addition to killing tree tops; reducing seed viability; creating conditions suitable for entry of other diseases and insects; and causing burls, brashness, and some mortality, the most serious impact on the tree is decreased height and diameter growth. Proper harvest-cutting systems, particularly clearcutting, can substantially reduce the mistletoe problem.

Three other important diseases are found in larch: needlecast caused by *Hypodermella laricis*, the quinine fungus *Fomitopsis officinalis*, and red ring rot caused by *Phellinus pini*. Many other less common, but potentially dangerous fungi, such as *Encoeliopsis laricina*, infect larch, but have not caused significant problems in the past.

Larch casebearer (*Coleophora laricella*) and western spruce budworm (*Choristoneura occidentalis*) are currently the two most serious insect pests of western larch. The casebearer was first detected in the northern Rockies in 1957 and since then has essentially spread throughout the entire larch forest type. However, introduced and native parasites, plus adverse weather conditions on many larch sites, appear to be reducing the casebearer problem. Severe defoliation by the casebearer can substantially reduce tree growth, but mortality usually is low.

Western spruce budworm has been a persistent problem wherever heavy populations of budworm overlap the range of larch. The most serious damage to larch is severance of the terminal leader, which results in an average loss of about 25 to 30 percent of the height growth for that year.

Characteristics and Properties

The heartwood of western larch is russet or reddish brown, and the sapwood is a straw-brown color and very narrow, rarely greater than 1 inch in width. The growth rings are distinct, quite uniform in width, and very narrow (30 to 60 per inch). The earlywood zone is usually about twice the thickness of the darker latewood zone, and the transition between the zones is abrupt. The wood often has an oily appearance, but has neither odor nor taste and is only slightly resinous. It is

one of the heavier and harder softwoods, with a density of about 36 pounds per cubic foot at 12 percent moisture content and with an average specific gravity of 0.48, based on green volume and ovendry weight. It is strong in bending and endwise compression, stiff, and moderately high in shock resistance. The species is generally straight grained with a coarse texture; and although it splits easily, the wood has a moderately high nail-holding capacity when blunt-pointed nails are used. It is easy to glue, but is low in paint-holding ability. The wood is rated as intermediate in resistance to decay. It is somewhat difficult to work, but takes a smooth, hard finish. The wood shrinks moderately and seasons fairly well, though difficulty is encountered with warping and checking. Western larch butt logs often contain large amounts of shake, which is a separation along the grain between annual rings.

Principal Uses

Construction lumber is the principal product of western larch. Because it is strong, timbers, planks, boards, and other dimension sizes are made from the species. Boards are used for interior finish, edge-grain flooring, water-tank stock, boxes and crates, railway car construction, and electrical machinery. For most purposes, western larch is used interchangeably with Douglas-fir.

Although western larch has sometimes been used for railway ties, this use is declining. The heartwood is moderately difficult to penetrate with preservative solutions. However, the species is used extensively for transmission and telephone poles, especially where long lengths and high strengths are required. Incising is a necessary prerequisite to obtain adequate preservative retention.

Larch is also a leading veneer and plywood species. Most of the veneer is rotary cut, and the plywood is used for sheathing by the construction industry.

Because of its hardness and resistance to splintering, larch has been used for mine-shaft guides. High-speed underground mine hoists run along these guides to lift personnel and ore. Mine timbers have also been made from larch.

Sawmill and plywood plant residues of western larch are chipped and used in the manufacture of pulp and paper. Before being processed into paper, the chips may be subjected to a water treatment for the extraction of a gum called arabinoglactan. This chemical is used as a coating for lithographic plates by the printing industry, as a pill or tablet binder by the pharmaceutical trade, and as an industrial emulsifier.

The tree provides considerable pleasure to many recreationists as it is frequently a large, dominant tree, and its fall foliage contrasts with the neighboring greens.

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Revised October 1984